

NASA Ames Research Center: The focus of programs at the NASA Ames Research Center includes the Center of Excellence for Information Technology, astrobiology, commercialization of NASA technology, commercial aerospace programs, and aviation testing and safety. These programs, which undergo periodic change based on leadership and federal budget initiatives, are closely tied to research and industry programs in Sunnyvale and the Bay Area region. As programs change, there may be impacts, positive and negative, on the local and regional industry base. However, the focus of information technology, astrobiology, commercial partnerships, and aviation research tracks with industry trends.

Onizuka Air Station: The Onizuka Air Station has been one of two Department of Defense satellite on-orbit command and control facilities in the Air Force inventory. With the 1995 Onizuka realignment decision, the City is involved in planning for conversion of Onizuka's defense capabilities to civil and commercial application of the technologies at Onizuka.

This defense conversion planning will mitigate loss of jobs in Sunnyvale and loss of technology skills in the region. The realignment is scheduled to be completed no later than 2004.

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## Rezoning Activity

A look at rezoning activity provides one measure of the demand for various types of land uses, as well as a reflection of City land use policies. If, for example, the market requires more land for residential development than is available under the existing zoning pattern, there may be requests to rezone land from industrial or commercial designations to residential.

Eighty-eight zone changes (478 acres) were approved between 1984 and 1994. While most of these zoning changes involved basic changes in land use (e.g., from industrial to residential), some simply involved the addition of a combining district, such as the Planned Development (PD) combining district, with the base zoning.

the City adopted several special planning documents, including the Southern Pacific Corridor Site Specific Plan, the Futures Study, the Downtown Specific Plan, the Precise Plan for El Camino Real, the 101/Lawrence Site Specific Plan, and the Lockheed Site Master Use Permit. (These special plans are outlined in Appendix B). These plans affect the City's land use and zoning in significant ways. For example, the Futures Study created a new combining district, Industrial to Residential (ITR), which was applied to 205 acres, allowing both industrial and residential uses for those properties. In addition, the City created new zoning regulations for the area covered by the Downtown Specific Plan and a new combining district for El Camino Real.

Seventy-one percent of the zoning changes that occurred between 1984 and 1994 created residential zoning on land previously zoned for other uses, or added a PD combining district to allow residential use of land zoned primarily for other uses. Some of the changes to residential zoning were initiated by the City, while others were initiated by property owners. These changes were in response to an ongoing market demand for residential development during this period.

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## TRANSPORTATION

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This section reviews Sunnyvale's transportation system in 1995, then looks at the outside influences and constraints, such as City land use decisions and their implications, that affect transportation planning for the City.

In reviewing the 1995 transportation system operating in Sunnyvale, the City's transportation capacity must be considered. Transportation capacity is determined by the following:

- ♦ The existing and planned transportation infrastructure (e.g., roads, signalization, transit opportunities, pedestrian and bicycle facilities)
- ♦ The use of infrastructure, including influences on transportation demand such as incentives or policies to influence travel time, mode choice, and route selection

The object of a transportation system is to provide opportunities for travel. Travel is defined as conveying people, goods, and services over distances. Travel within Sunnyvale takes a variety of forms in response to travel demand, from driving to transit to flextime to alternate modes. Transportation is a complex web of travel modes, operators, and behaviors. This section describes the existing and projected transportation infrastructure and the way the transportation system is used.

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### Automobile Transportation

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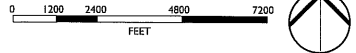
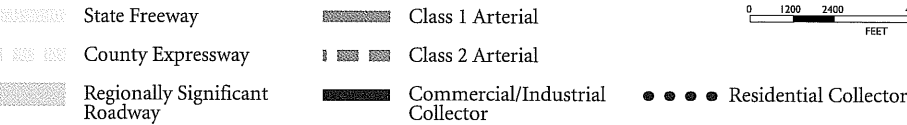
#### *Roadways*

Sunnyvale's network of approximately 298 miles of roadways is extensively traveled by residents and commuters. Approximately 50 miles of this network are major roadways serving both local and regional users. Freeways and expressways comprise approximately 13 miles of this major roadway network system. Arterials provide approximately 35 miles of roadway, and collectors provide approximately 58 miles of roadway. Figure 2.19 shows the functional classification of roadways in the City.

Figure 2.19: Roadway Classification Map



Source: Sunnyvale Dept. of Public Works, 1997



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### *Street Design Standards*

The City has established street design and construction standards for roadways within Sunnyvale. These standards generally come from three primary sources: industry standards established by the American Public Works Association (APWA); the CalTrans design standards; and the City's Standard Specifications and Standard Details Manual. All of these specifications are periodically updated.

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### *Intersection Control*

Uncontrolled, conflicting intersection traffic movements can result in delays and accidents. Intersection traffic signals provide the most efficient control of high volume conflicting movements. Properly designed traffic signals help to maximize traffic flows with minimum delays and reduce certain types of accidents.

As of 1997, Sunnyvale has 116 City controlled traffic signals in operation, 59 of which are interconnected. Traffic signal interconnection is used to reduce the number of stops by providing successive green phases at adjacent signalized intersections in the major direction of travel. Other agencies and organizations such as the Santa Clara Valley Transportation Authority (VTA), the State of California Transportation Agency (CalTrans), and Lockheed Martin also operate traffic signals on public and semi-public roadways within the City.

The City is responsible for intersection operations and traffic signal and sign preventive maintenance. The City currently contracts out signal maintenance functions to a private firm. Traffic signal operations are analyzed annually by City staff to assure traffic safety and to reduce the City's potential liability.

The City conducts field observations, annual reviews of accident and traffic volume data, responds to traffic control warrant studies, and responds to public requests prior to considering and planning new intersection controls.

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### *Roadway Maintenance*

The City maintains or contracts maintenance of 595 lane miles of street surface and the associated signs and striping.

*Pavement Management:* The City uses a Pavement Management System (PMS) to identify and prioritize major preventive and corrective maintenance needs. All City streets are surveyed and rated on a biennial basis. Maintenance needs are identified by measuring observed pavement conditions against a City standard for system-wide average pavement surface conditions and standards establishing road repair strategies with the condition rating for individual street segments. Depending on the rating of a specific street, differing repair approaches ranging from patching to reconstruction may be required. Larger resurfacing jobs are usually contracted out to private firms, with City crews primarily handling preventive maintenance such as crack sealing and filling of potholes.

Pavement management has been a focal point for innovation in the City. Over the last ten years, the City's PMS has reduced annual maintenance costs by nearly 25%. The current focus is on new materials and processes that will result in longer lasting surfaces. Staff regularly evaluates new products and techniques, and adopts successful, cost-effective methods.

*Roadway Marking and Signing:* The City also provides roadway signs and striping.

*Street Cleaning:* Street, roadside area, parking district, walkway and bike path cleaning are ongoing City services. Street cleaning of all City streets occurs on a bi-weekly basis, in addition to an as-needed or requested basis.

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### *Street Lighting*

The City maintains an extensive system of street lights for the purpose of pedestrian and vehicle way lighting and to reduce the likelihood of crime. Streetlights light arterial streets, industrial area streets, selected residential areas, and City-owned parking lots. City-owned streetlights predominate, although Pacific Gas & Electric also owns and maintains some lights in the City. City-owned lights on industrial arterial streets and in City-owned

parking lots are routinely surveyed for maintenance needs. The City also monitors new lighting technologies and circuiting techniques to reduce energy and maintenance costs.

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### *Street Trees and Landscaping*

The City has policies and standards for street trees and landscaping. Street trees and landscaping promote the City's image, define the City's boundaries, characterize roadways and districts, and enhance adjacent property.

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### *Parking*

The City regulates parking on City streets and operates a downtown parking district. Most residential streets have no parking restrictions. All parking on City-owned lots and streets is free. The only pay-parking lot in Sunnyvale is operated by CalTrain at the CalTrain Station. Parking on City streets and lots near the CalTrain Station is subject to maximum time restrictions during the day to discourage parking by commuters. The City imposes minimum on-site parking requirements for private development.

The Downtown Parking District was created in the early 1960s to encourage downtown revitalization. The District removed the requirement that individual properties provide their own parking, which might have discouraged development in this older area of the City. All properties within the district are now assessed a share of the costs of maintaining and operating the Parking District facilities.

Parking standards for new development are defined in the Sunnyvale Municipal Code. These standards are occasionally modified in response to new or changed conditions, such as new land use types or changing parking demands. The City's parking standards are comparable to other jurisdictions.

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### *Long Range Infrastructure Planning*

The City has embarked on a long range infrastructure planning effort. This effort recognizes increasing maintenance needs over the next 40 years as facilities age. Those needs are managed through database inventories of the City's major infrastructure components. Transportation infrastructure has been identified as a key component.

Inventories, replacement schedules, and detailed cost estimates have been prepared for traffic signal equipment, bridges, overpasses, street surfaces, street lights, sidewalks, and landscaping. Budgets have been modified and, where necessary, new budgets and rolling funds have been created to cover the complete costs of replacement of infrastructure.

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### *Traffic Volumes*

Sunnyvale's major roadways normally handle high traffic volumes, although the level of traffic sometimes fluctuates due to changing economic conditions, such as business downsizing and restructuring. For example, a peak of 665 million vehicle-miles were traveled in 1989, whereas 630 million vehicle-miles were traveled in 1995. This five percent drop in traffic volume coincides with an economic downturn experienced by the city and county between 1989 and 1995. Sometimes traffic patterns change as new roadways (such as SR-85) are opened or existing roadways are improved, influencing commuters to change their routes. While this response may move traffic from one roadway to another, the total City-wide traffic volume may not change.

Two freeways (US-101 and SR-237) cross Sunnyvale in a generally east-west direction. East-west travel is also served by Central Expressway. When SR-237 was improved to freeway standards between Maude Avenue and Interstate 880 (Milpitas), regional traffic flow improved at some Sunnyvale interchanges. A significant share of the traffic on the City's streets, particularly commute peak hour traffic, is in the north-south direction. Besides SR-85, three major arterials or expressways serve the north-south traffic: the Mathilda Avenue/Sunnyvale-Saratoga Road corridor, Lawrence Expressway, and the Wolfe Road/Fair Oaks Avenue corridor. The completion of the southern end of SR-85 from Stevens Creek Boulevard to US-101 in south San Jose has diverted some long-distance trips from US-101 to SR-85. While the new freeway has not significantly affected



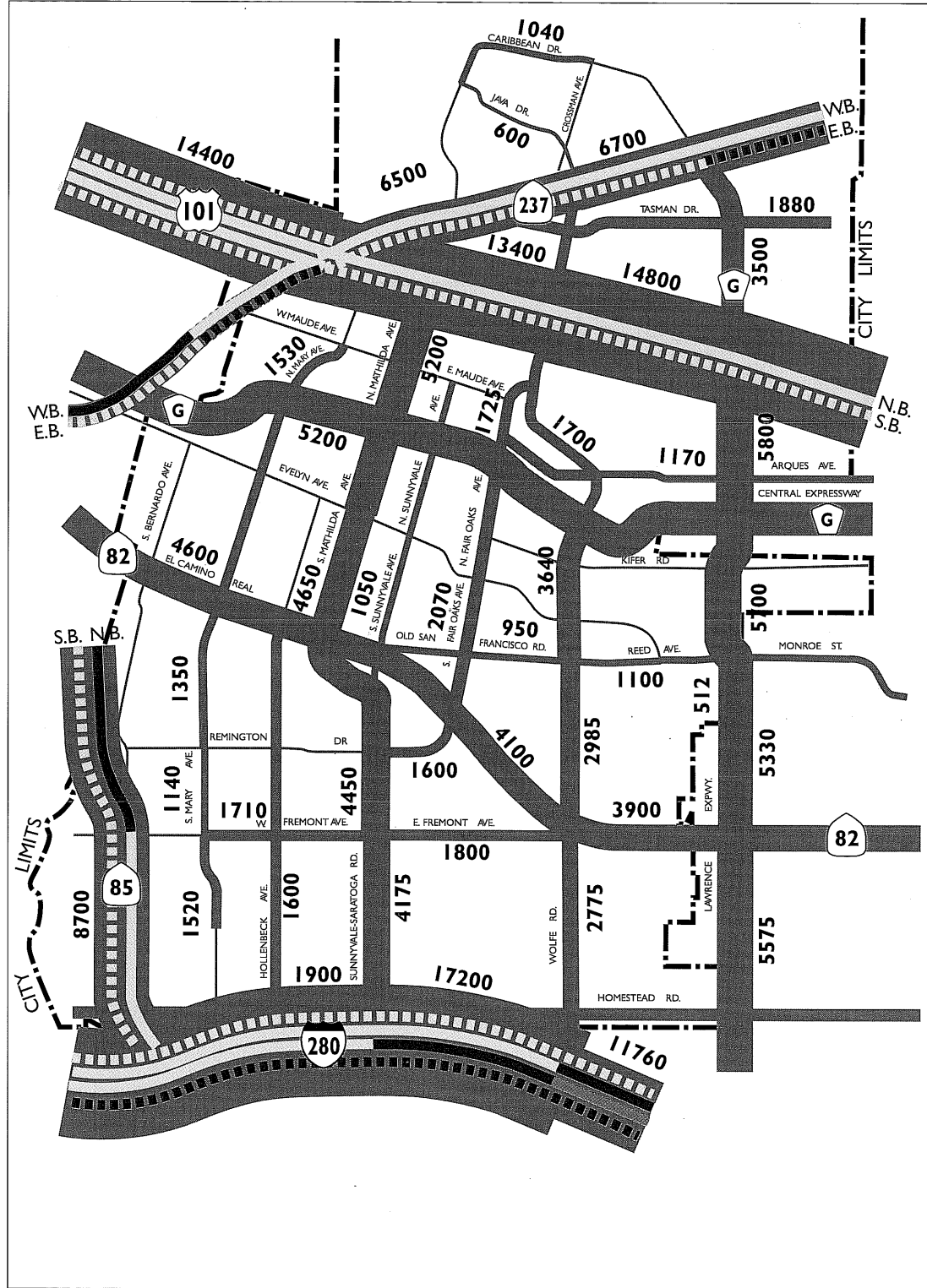
traffic volumes in the north-south corridors of the City, the number of vehicles accessing the freeway via Fremont Avenue has increased.

Figure 2.20 shows peak hour traffic flows in 1995. Due to their high capacity, freeways accommodate the highest volumes. With eight lanes, US-101 and I-280 had traffic volumes of nearly 14,000 and 17,000 vehicles per hour respectively during peak commute hours. SR-237 and SR-85, each with four to six lanes, served between 6,500 and 8,000 vehicles per peak hour.

Expressways also carried high volumes of traffic (5,000 or more vehicles per peak hour during weekdays). However, expressway capacity is less than freeway capacity due to at-grade traffic signal controlled intersections.

In 1995, several arterials were serving very high demand. Two of the high volume arterials, Mathilda Avenue/Sunnyvale-Saratoga Road (with an average peak hour volume of 5,200 trips) and Wolfe Road (with 3,640 peak hour trips) are major north-south corridors. El Camino Real, an east-west arterial operated by the state, also carries high volumes of traffic, averaging over 4,000 peak hour trips. Arterial streets are directly accessed at intersections and by residential and commercial driveways. The result is an increase in traffic interruptions, restricting the street's ability to handle traffic volumes. Therefore, these streets are prone to congestion at lower traffic levels than freeways and expressways.

Figure 2.20: 1995 Peak Hour Traffic Flows Map



Source: Caltrans; City of Sunnyvale Dept. of Public Works

- LOS ABC (a.m.)
- LOS ABC (p.m.)
- LOS DE (a.m.)
- LOS F (a.m.)
- LOS F (p.m.)

Scale: 1000 vehicles = 0.04"



### *Level of Service (LOS)*

The performance of roadways is assessed by the operating levels of service. LOS is influenced by traffic volumes, available roadway capacity, and traffic control features. LOS is indicated on a scale from A (free flow) to F (congested). (See Figure 2.21 for term definitions.)

**Figure 2.21: Level of Service (LOS) Ratings**

<b>LOS</b>	<b>Intersection Delay (Seconds)</b>	<b>Traffic Flow Condition</b>
A	0 to 5	Free flow
B	5 to 15	Some restricted speed
C	15 to 25	Restricted speed; intersection left-turn backups
D	25 to 40	Some extensive delays; little freedom to maneuver
E	40 to 60	Traffic approaching full capacity; some stoppage
F	More than 60	Long stoppages; low operating speeds

Sunnyvale's 1995 LOS at selected intersections are shown in Appendix C. Monitoring the LOS on Sunnyvale roadways is one of several tools that helps determine which sections of the roadway network are performing poorly and, therefore, should be considered for improvement projects or programs. State law and City policy determine acceptable LOS.

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## Projected Automobile Use

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### *Future Traffic Volumes*

It is expected that the strong north-south orientation of auto travel in Sunnyvale will continue at least through 2010. The anticipated demand for SR-85 is over 11,000 trips during the afternoon peak hour. Certain segments of Lawrence Expressway will have to handle close to 10,000 trips during the same peak hour. On the other hand, east-west roadways, including both arterials and freeways, will generally experience only modest increases in traffic demand. The exception is SR-237, which may add as many as 4,000 trips in the afternoon peak hour, for a total of over 10,500 peak hour trips.

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### *Future Levels of Service*

Studies indicate that increases in future traffic volumes will result in poorer roadway performance. The projected performance of selected intersections is shown in Figure 2.22 below. Levels of service at many intersections will decrease. Some may operate at LOS F if no improvements are made beyond those currently included as programmed projects.

**Figure 2.22: 1990 and 2010 Projected PM Peak Levels of Service**

Intersection		LOS	
		1990	2010
Mary Avenue	@ El Camino Real (SR 82)	C	E
	@ Fremont Avenue	C	D
	@ Maude Avenue	B	C
Mathilda Avenue	@ El Camino Real (SR 82)	D	E
	@ Java Drive	C	C
	@ Maude Avenue	B	D
	@ Washington Avenue	C	F
	@ Iowa Avenue	B	F
Fair Oaks Avenue	@ Arques Avenue	C	D
	@ Crossman Avenue	B	E
	@ El Camino Real (SR 82)	E	E
Lawrence Expressway	@ Arques Avenue	D	E
	@ Homestead Avenue	E	F
	@ Reed Avenue/Monroe Street	D	F
	@ Lakehaven/Sandia	E	E
	@ Tasman Drive	C	F
Sunnyvale-Saratoga Road	@ Fremont Avenue	D	D
	@ Homestead Road	D	E
	@ Remington Drive	D	E
Wolfe Road	@ Homestead Avenue	C	E
	@ El Camino Real (SR 82)	D	E
	@ Fair Oaks Avenue	A	A
	@ Fremont Avenue	D	E
	@ Kifer Road	C	E
	@ Old San Francisco Road/Reed Avenue	D	D

Source: Sunnyvale Futures Study, ADEIR, August 1992, and Lockheed Master Use Permit Application DEIR, January 1994, Downtown Development Program EIR, Kaiser Replacement Project EIR, Tasman Corridor Project EIS/R.

Lawrence Expressway is expected to be operating at LOS F at several intersections prior to 2010. Most intersections on other roadways will still have enough capacity to handle 2010 traffic without violating the Congestion Management Program (CMP) standard of LOS E. However, with the current City standard at LOS D, several intersections may operate at LOS E in the absence of mitigation measures, thus violating the City standard.

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### *Major Planned Improvements and Mitigation Measures*

Typically, major roadway improvements are planned and constructed in order to mitigate existing and anticipated traffic problems. Roadway improvements usually require long lead times (typically 5 to 10 years). Most major projects of regional impact are under state and/or county control. A list of near-term improvements that were included within the City's ten year Capital Improvements Program budget at the time this plan was prepared is included in Appendix D.

The City plans to implement some roadway improvements to mitigate the impacts of major land use plans that have been approved. These improvements are shown in Appendix E. These improvements had not been included in the City's ten year Capital Improvements Program budget at the time this plan was prepared.

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### *Bicycle Transportation*

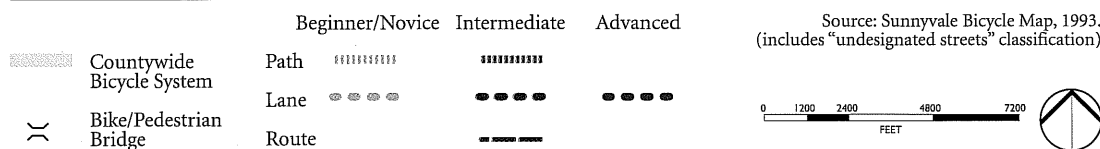
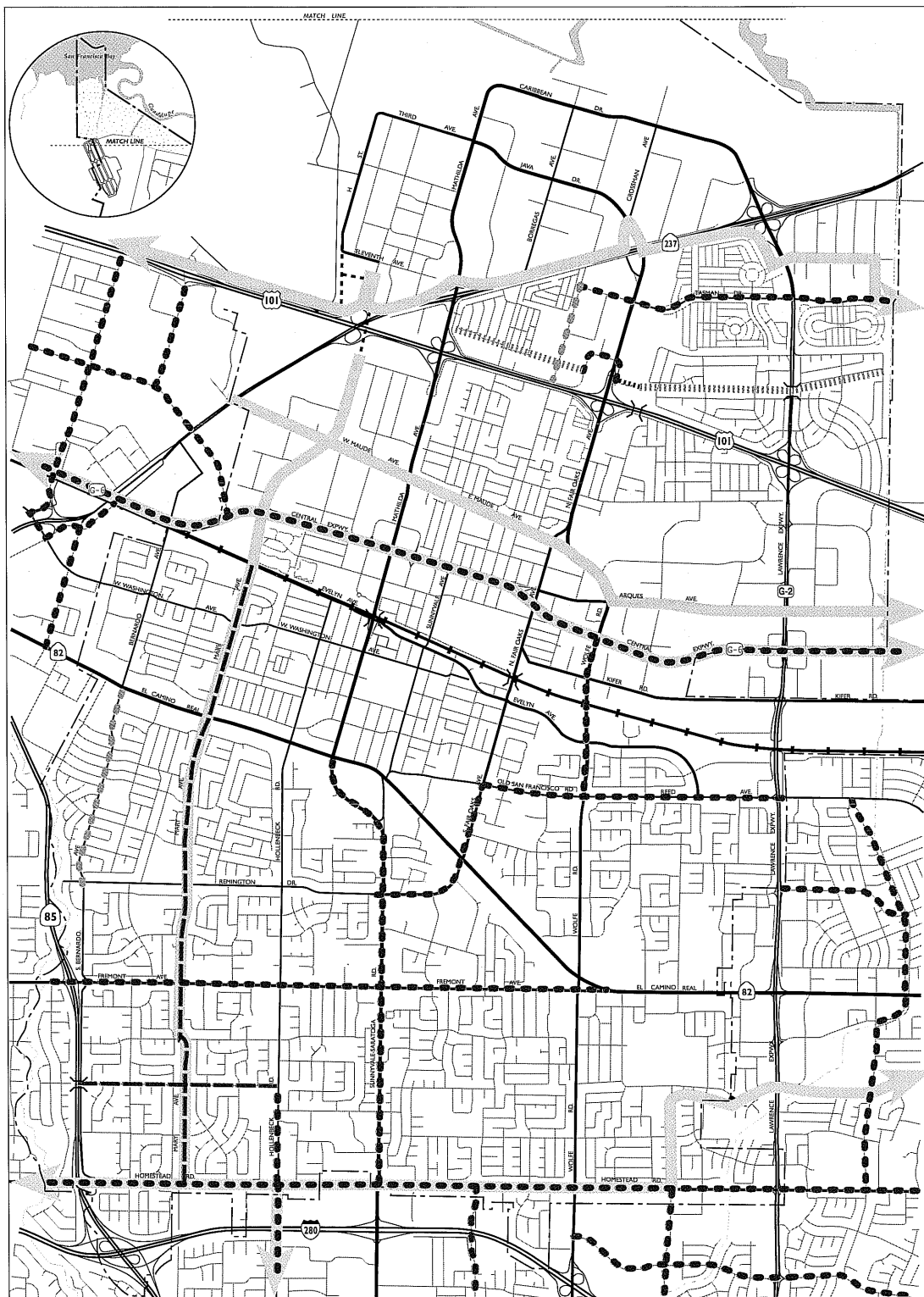
The 1995 Sunnyvale bicycle system includes a 2.6 mile bicycle path, 15.0 miles of bicycle lanes, and 4.6 miles of bike routes, for a total of 22.2 miles of bikeways. The City's bikeway network is limited. It does not adequately serve major employment sites in the northern part of the City or other potential high-use sites, such as schools. There are few north-south connections and only two bikeways traverse the City east-west. (See Figure 2.23)

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### *Integrating Sunnyvale's Bikeways with Other Jurisdictions*

There are a few links between Sunnyvale bikeways and bikeways in the neighboring cities of Mountain View, Cupertino, and Santa Clara. Santa Clara County allows bicycles on all expressways. Central Expressway links Sunnyvale, Mountain View, and Santa Clara, while Lawrence Expressway links Sunnyvale with Santa Clara and Cupertino to the south.

Figure 2.23: Sunnyvale Bicycle System Map  
(without "undesigned streets" classification)



State and regional programs that encourage and support bicycling include the Transportation Development Act, Congestion Management Program Transportation Demand Management Element, and the Santa Clara Valley Transportation Authority (VTA) T2010 transportation plan. These plans encourage linkages to improve regional bikeway connections. The Transportation Development Act provides a portion of state sales tax revenue for local bicycle and pedestrian projects.

City policy supports use of Santa Clara Valley Water District (SCVWD) rights-of-way for bicycling. The SCVWD will allow bicycle use subject to certain conditions. Most SCVWD facilities are unsuitable for cycling in their current physical configuration. No bikeways had been developed in these rights-of-way by 1997.

Improvements have been made to encourage linkages between bicycling and transit. Some facilities, including bicycle lockers and racks, are provided at the two CalTrain stations in Sunnyvale. Cyclists can bring bicycles on board all CalTrain trains. Bicycles can be brought on all Santa Clara Valley Transportation Authority bus routes and the light rail system seven days a week. The VTA has installed racks on all buses and is expanding bike capacity inside all light rail trains. A recent survey showed that nearly 2% of total daily passengers boarded the VTA transit system with a bicycle.

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#### *Current Bicycle Use*

Less than 1% of all commute trips made by Sunnyvale residents are made by bicycle. The percentage of bicycle commute trips made by all Santa Clara County residents is slightly higher at 1.5%. No data is available on the frequency of bicycle trips for recreational or shopping purposes. Bicycle mode share may potentially increase if the City's bicycle network, and in particular the north-south linkages, are further developed.

The state and the City have dedicated funds to implement minor improvements for bicycling, such as providing for bike parking. It is uncertain whether this funding will continue. The City adopted a bicycle plan in 1984 and revised it in 1993. The City has also established a citizens Bicycle Advisory Committee (BAC) to advise the City Council.



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## Pedestrian Transportation

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Three primary characteristics of the land use pattern in Sunnyvale influence opportunities for pedestrian travel:

- ♦ The separation of land uses
- ♦ The curvilinear/branch road/cul-de-sac street pattern that results in fewer connections between different parts of the City
- ♦ The relationship of buildings to the streets, such as neighborhood commercial centers that are separated from the streets by parking lots

Sunnyvale has been developed with large land areas containing similar uses (such as single-family residential neighborhoods, industrial parks, etc.). For example, most residential areas are more than one-half mile away from commercial centers (an average ten minute walk).

The neighborhood street pattern, especially in the southern part of the City, is marked by wide, heavily traveled arterial streets (four to six lanes plus turning lanes) at one-mile intervals. Major east-west transportation corridors (such as El Camino Real and the CalTrain tracks) act as pedestrian barriers between residential areas in the south and job-sites in the north. Some pedestrian overpasses have been provided (one over Highway 101 and two over the railroad tracks), but shorter, more dangerous routes (e.g., directly over roadway overpasses or the railroad tracks) may tempt pedestrians, creating a potential safety hazard.

Traffic signals with pedestrian push-buttons and walk/don't walk indicators are located at all major intersections. Sidewalks have been provided in most residential and commercial areas and are now required in industrial areas, but are only installed with new development.

Only about 1.6% of all commute trips by Sunnyvale residents are made by walking. However, pedestrians walk for other purposes in addition to work commuting. People walk to stores and parks and often walk for recreation and exercise as well. In addition, there is a direct link between walking and transit - people must walk to access transit service.

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## Transit

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### *Santa Clara Valley Transportation Authority (VTA)*

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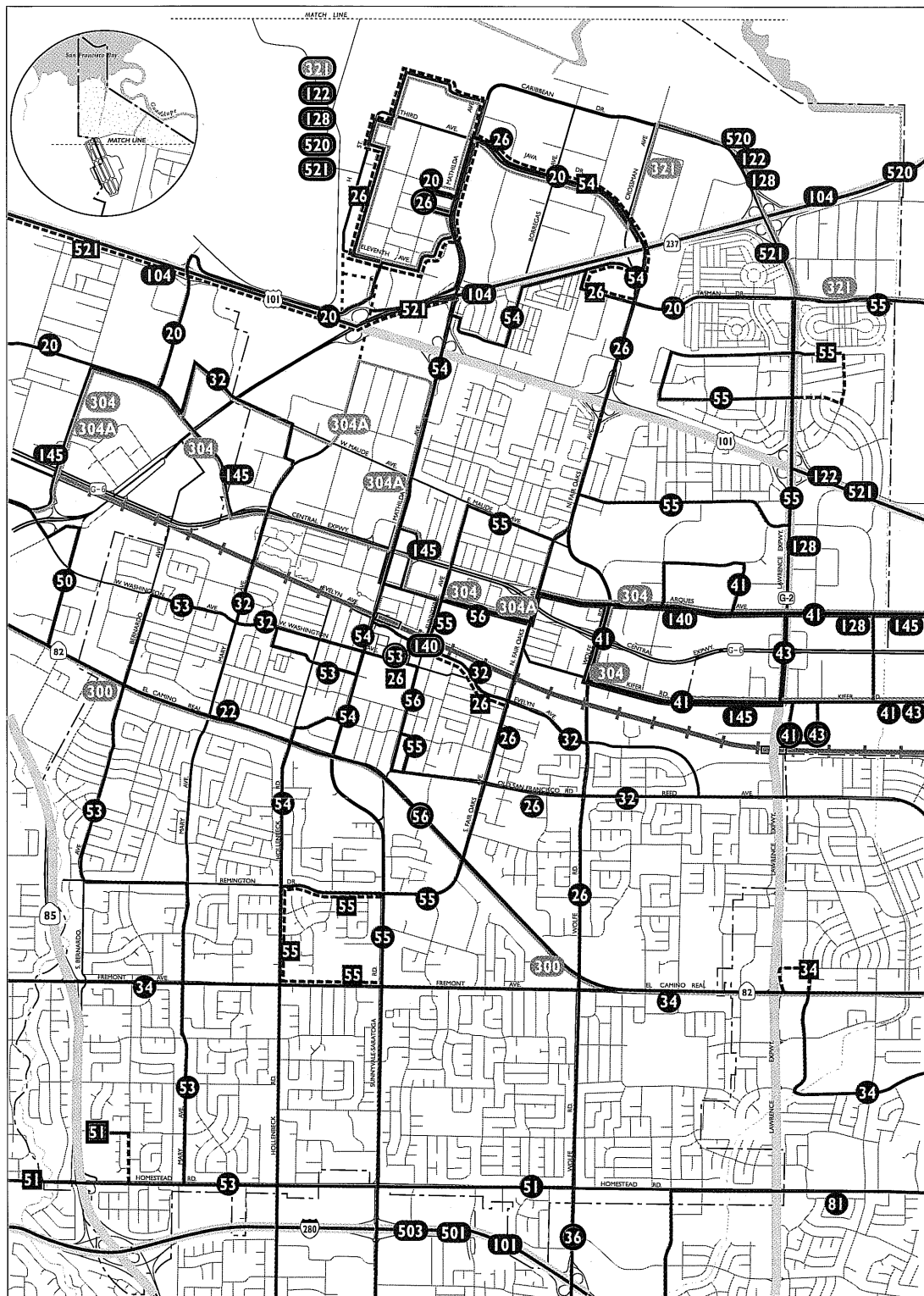
The VTA provides bus services in Sunnyvale and operates an extensive network of local, grid, and express bus routes. Bus service focuses on downtown Sunnyvale, the Moffett Industrial Park, and the El Camino Real corridor. Figure 2.24 shows the bus routes operated by VTA in 1995.

Transit service in Sunnyvale and the Santa Clara Valley has been expanded greatly since the 1970s, when the forebearer of the Santa Clara Valley Transportation Authority (VTA), the Santa Clara County Transit District, was formed. The transit service began as an agglomeration of three ailing local bus services. Initial service with 50 aged buses has grown to a modern, multi-faceted transit service featuring over 460 buses, an expanding light rail system, a commuter rail corridor (in partnership with San Mateo and San Francisco Counties), and an extensive network of quasi-public shuttle services. Currently, total ridership for all services surpasses 190,000 riders daily.

The VTA's Strategic Plan calls for a 30% increase in the bus fleet (to 600 buses) and a 25% increase in service hours in the next 10 years. It also includes significant improvements to VTA's Line 22 service to transform it into a rapid bus corridor.

In Sunnyvale, the VTA and other transit providers carry approximately 3% of daily commute trips. This modal share has stayed relatively steady since 1980. Transit accessibility during the peak commute periods has increased over the last decade so that almost all Sunnyvale residents have access to transit within ¼ mile of their homes. Transit ridership has fallen and risen in the last ten years consistent with fluctuations in the local economy. If planned increases in service are funded, there is greater potential for increased ridership. However, past trends indicate that service increases have not increased the modal share of travel by transit.

Figure 2.24: Santa Clara Valley Transportation Authority Bus Routes Map



Source: Santa Clara Transportation Authority, July 1997



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*CalTrain*

The Peninsula Corridor Joint Powers Board (JPB), composed of members from Santa Clara, San Mateo, and San Francisco counties, operates CalTrain. CalTrain operates the Downtown Sunnyvale Station and Lawrence Station in Sunnyvale. CalTrain's frequencies, equipment, and physical plant are steadily being improved. Facilities developed to promote ridership at the two stations include rain shelters, bicycle lockers, and inexpensive all day parking for automobiles. VTA bus connections are also offered at CalTrain stations.

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*Transit Usage*

Paralleling the trend county-wide, transit's share of the mode split has declined over the last seventeen years. In 1995, 2.5% of Sunnyvale residents used transit for commuting, as compared to 3.5% in 1980. However, transit ridership is increasing as the region's population grows and transit service is increased. CalTrain has realized a significant long-term increase in ridership from stations in Sunnyvale. In 1980, 1,660 CalTrain trips began or ended in Sunnyvale, as compared to 3,990 in 1997. VTA bus and light rail ridership increased by almost 20% between 1995 and 1997, consistent with overall increases in travel. Current 1997 data show that for the 382 bus stops in Sunnyvale, there are 9,134 boardings and 8,992 daily deboardings daily.

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*Transit Network Forecast*

The Santa Clara Valley Transportation Plan (T2010) anticipates increasing the County bus fleet, which would allow for provision of new routes and increases in existing services. T2010 also anticipates establishing a comprehensive rail transit system in Santa Clara County to support urban densification. However, this rail expansion would be contingent upon funding for capital projects and a new permanent source of operating funds.

The Tasman West light rail transit (LRT) expansion is currently under construction and will be routed from Santa Clara through northern Sunnyvale and Mountain View, using the Tasman Drive, Java Drive, and Mathilda Avenue corridors to service Sunnyvale. This extension will create a light rail transit corridor stretching from

Mountain View and north Sunnyvale through northern Santa Clara, northern and central San Jose, and terminating in south San Jose. A total of six stations will be located in Sunnyvale. The LRT will provide direct service to Lockheed/Martin, the largest employer in the County. A transit center facilitating access to all transit modes will be constructed at 5th Street and Mathilda Avenues at the Lockheed/Martin site. Tasman West will be operational by 2000.

The long-term plan for Santa Clara County calls for creation of a comprehensive, Countywide light rail transit network, including service to downtown and south Sunnyvale. Major transit capital improvement projects are contingent on securing funding in a highly volatile transportation funding environment.

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### Paratransportation

Throughout the County, paratransit services are undergoing a transformation in response to the Americans with Disabilities Act (ADA). The ADA requires transit agencies to develop plans to provide paratransit access that is equivalent to the transit service offered to all riders. The plan must also include service coordination that addresses ADA service criteria. In response, the VTA has established a system combining accessible fixed-route buses and privately contracted, brokered paratransit. The brokerage contractor utilizes subcontractors to provide prescheduled taxis, group vans, and wheelchair-accessible vans.

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### *Physical Improvements for the Elderly and Mobility-Impaired*

The needs of elderly and mobility-impaired Sunnyvale citizens are addressed by the design and construction of roads and sidewalks, including handicapped ramps. The City has also installed several audible pedestrian signals. This program is consistent with the requirements of the ADA, and follows a city ADA Transition Plan.

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## Freight Transportation

Sunnyvale's freight movement consists primarily of intercity trucking on freeways through the City. The City's SMaRT station and garbage collection service are the next most significant users of heavy vehicles on City streets. The City maintains designated truck routes for trucks over three tons, which is consistent with the California Vehicle Code. The City requires transportation permits and collects fees for oversized loads in accordance with state law.

While rail freight has declined with the decline of heavy industry, there are several businesses on the eastern side of the City that still use this mode. The Southern Pacific Transportation Company operates freight trains daily to serve Sunnyvale industry, using trackage rights on the CalTrain line.

Future public investment to accommodate freight may focus on regional streets and highways, in conjunction with the freight system network designated by the Metropolitan Transportation Commission (MTC). Rail freight services are likely to continue to decline as rail commuter services along the San Francisco-San Jose rail line take precedence.

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## Aviation

There are no airports or other general use aviation facilities located within Sunnyvale. However, aviation is an intrinsic element of the City's transportation infrastructure, because of the impacts nearby aviation facilities have on the City.

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### *Moffett Federal Airfield*

Moffett Federal Airfield, the former Moffett Field Naval Air Station, is located within the sphere of influence of the City. The United States Navy turned the airfield over to the NASA/Ames Research Center in July 1994. Aviation uses of the airfield are limited to federal and federally-hosted operations. However, federal aerospace and defense reductions and budget cuts have created an uncertain situation.

NASA plans to keep the airfield available for Department of Defense flight operations, test flights, and federal shipping. NASA is also exploring other economic development opportunities related to

transportation, technology, and land use. (Moffett Federal Airfield is also discussed on page 50 in this chapter.)

There is a county-wide shortage of general aviation capacity. The County General Plan contains a policy to study general aviation system requirements, paying particular attention to Moffett Federal Airfield. However, one issue of particular concern to many residents in Sunnyvale, particularly northern neighborhoods, is the noise generated from the use of this facility in the past.

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### *San Jose International Airport*

San Jose International Airport is located approximately six miles east of Sunnyvale. The airport, operated by the City of San Jose, provides commercial air carrier and air cargo services, and hosts general aviation as well. The San Jose City Council adopted the San Jose International Airport Master Plan Update in June, 1997. The Airport Master Plan Update includes significant additions to airport facilities, including the lengthening and upgrading of one runway for use by commercial carriers and the addition of a third terminal. The forecasted changes over the planning period are summarized below:

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**Figure 2.25: San Jose International Airport Facilities**

	1996	2010
Passengers	10 Million	17.6 Million
Runways:		
Total	3	3
Commercial	1	2
Terminals	2	3
Gates	31	49

*Source: San Jose International Airport Master Plan Update, Executive Summary, 1997.*

The Airport Master Plan Update also indicates that cargo service will increase, while airport use by small aircraft will decrease.

The number of passengers served by the San Jose International Airport is expected to nearly double in the next 15 years. Aircraft noise from this facility has been a concern for many northern Sunnyvale residents.

## Outside Influences

Outside agencies, from the federal government to neighboring jurisdictions, also exert influence on the City's transportation policies and have a role in implementing plans. Federal and state transportation programs, the Bay Area Clean Air Plan, and regional congestion management plans are examples of policies developed by other agencies (or cooperatively with local jurisdictions) to which the City must respond. Further, several transportation services and facilities within City limits are operated and maintained by other agencies, including state highways and county expressways, the transit system, and paratransit services (see Figure 2.26).

**Figure 2.26: Transportation Facilities Controlled or Affected by Outside Agencies**

Facility	Jurisdiction
Highway 101	State/CMA
Central Expressway	County/CMA
El Camino Real (Route 82)	State/CMA
Highway 237	State/CMA
Lawrence Expressway	County/CMA
Mathilda Avenue	City/CMA
Sunnyvale-Saratoga Road	City/CMA
Highway 85	State/CMA
Caribbean Drive	City/CMA
Peninsula rail service (freight and passenger)	Peninsula Corridor Joint Powers Board
Bus and Light Rail Transit	Santa Clara Valley Transportation Authority/CMA
Paratransit	Santa Clara Valley Transportation Authority/CMA
Various traffic signals at City limits	City/Neighboring cities
Lockheed/Martin roadway system and other roadway systems wholly on private property	Property owners

Because transportation infrastructure and equipment are so expensive, local jurisdictions are often not able to fund major transportation projects without financial assistance from state and federal agencies. These agencies have their own priorities for the kinds of transportation projects they prefer to fund. Although local jurisdictions have the opportunity to make a case for their own priorities, the competition for funds tends to influence transportation planning decisions toward the priorities of the funding sources, providing transportation planners with less flexibility to develop plans based solely on the needs and values of the community they



serve. In addition, when funds are received from outside sources, they come with regulations attached. These regulations add to the complexity of planning and administering transportation projects. However, since many transportation facilities and resources serve regional needs (rather than just local needs), these needs are appropriately addressed at the regional, state, and federal levels, where coordinated planning can take place.

Funding agencies are not the only outside agencies that influence local transportation planning. Many transportation modes have impacts on air and water quality and may contribute to noise levels as well. Since some modes have greater environmental impacts than others, the choices that local jurisdictions make to provide or promote certain transportation modes become environmental concerns. Over the last several decades, air and water pollution have become significant issues. Federal, state, and regional agencies have been created to find ways to decrease or eliminate pollution sources. Regulations developed by these agencies have a major impact on local transportation planning.

The City's role as a local transportation provider is one part of a complex web of providers, regulations, and plans. The following paragraphs present the realm of federal, state, and regional laws, and implementing agencies.

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### *Outside Regulation*

Recognition of the functional relationships among transportation, land use, and air quality led to legislation in the 1980s and 1990s. Examples of this legislation include the Federal Clean Air Act (as amended in 1990), the California Clean Air Act (CCAA, 1988), Congestion Management Program requirements in California (CMP, 1990), and the Intermodal Surface Transportation Efficiency Act (ISTEA, 1991). One goal often incorporated into legislation has been interjurisdictional cooperation in planning. The CMP and ISTEA seek to promote cooperative decision-making and provide local agencies with increased flexibility in the allocation of transportation improvement funds. These legislative actions also recognize the need to link land use planning and development with transportation planning. Transportation plans are required to be consistent with air quality policy and regulations as well. State and federal funding are tied to certain provisions of these laws.

While the City is legally mandated to comply with this legislation, certain tools are provided for carrying out the mandated policies. Regional decision-making bodies, which include representation from local jurisdictions, are empowered to create broad, balanced transportation and land use policies and programs. Regional transportation and land use monitoring systems provide ongoing data. Authority and funding for alternative transportation projects and programs are granted by regional agencies.

There are also potential penalties for not complying with some of this legislation. For example, the congestion management legislation requires local agencies to provide and execute deficiency plans when transportation levels of service decline to unacceptable levels and mitigation is not feasible. Deficiency plans must offset deficient levels of service, whether caused by local agency development decisions or by general regional growth. If a local agency does not comply with this requirement, a portion of state gas tax subventions can be withheld from the agency.

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#### *Congestion Management Agencies*

The congestion management legislation required the formation of Congestion Management Agencies (CMAs) for every urbanized county in California. In Santa Clara County, the Santa Clara Valley Transportation Authority (VTA) has been designated as the CMA by all of the cities and the County of Santa Clara. As such, the VTA has considerable influence over transportation and land use planning conducted by local jurisdictions. The Congestion Management Program (CMP), a biennial document that sets performance standards for roadway, transit, and other transportation modes, is a conduit for state and federal transportation funds. Deficiency plans and Transportation Impact Analysis requirements can impose mitigations that may, in some cases, limit the development of land. Congestion management programs also contain requirements for promoting alternative transportation uses, consistent with air pollution control measures or regional clean air plans. The Congestion Management Agency is also preparing a Countywide Deficiency Plan (CDP) to address funding for transportation capital improvements. The CDP is discussed in Chapter 1.

The VTA has designated certain roadways throughout the County, including select Sunnyvale roadways, as part of the CMP Roadway System (Figure 2.27). This system includes all state highways, county expressways, and roadways that connect with the freeway and county expressway system and meet one of the following criteria: (1) state highway; (2) six-lane facility; or (3) nonresidential arterial with average daily traffic of 30,000 vehicles per day.

Regional growth and specific development projects are monitored to determine the level of traffic impact they may create within the Congestion Management Program system. Local jurisdictions must maintain the required levels of service (LOS) on local roadways incorporated into the CMP network, or mitigate deficiencies in the level of service according to CMP requirements.

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#### *CMP and Transit Governance*

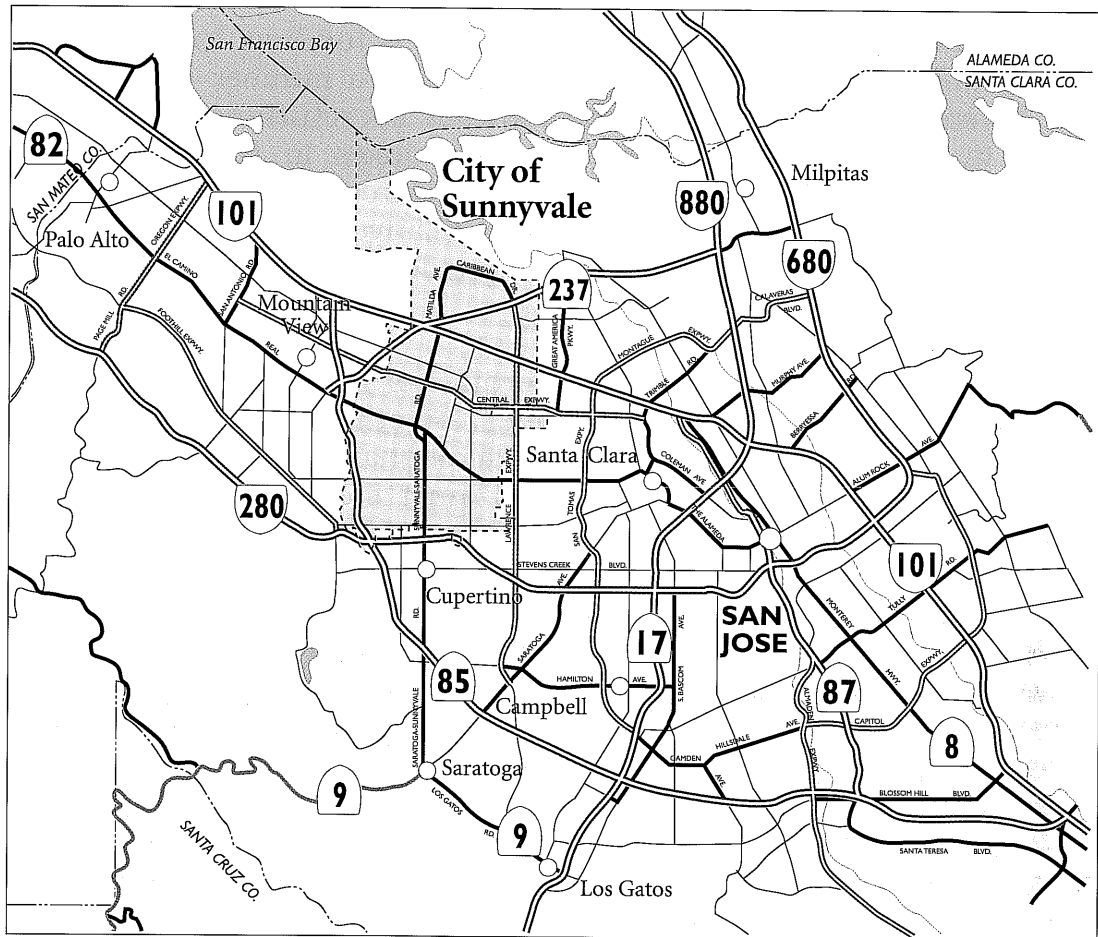
On January 1, 1995, the Santa Clara County Congestion Management Agency and the Santa Clara County Transit District merged to become the Santa Clara Valley Transportation Authority (VTA). This merger integrated transit service and congestion management, and permitted more direct participation by local agencies through their membership on the Board of Directors. The Board of Directors of the VTA is made up of representatives of Santa Clara County cities and the County Board of Supervisors. Therefore, cities including Sunnyvale do have a direct opportunity to influence the region's response to congestion management regulations.

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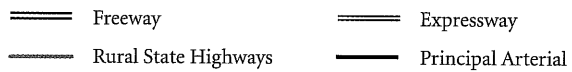
#### *The Peninsula Corridor Joint Powers Board (JPB)*

The JPB, composed of member transit agencies from Santa Clara, San Mateo, and San Francisco counties, operates CalTrain. The VTA contributes a formula share of the local funding to operate CalTrain between San Jose and San Francisco and 100% of the local funding for service between San Jose and Gilroy.

Figure 2.27: Congestion Management Program Roadway Network Map



Source: Santa Clara County Congestion Management Program, 1995



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### *Outside Funding*

An essential tool in implementing any plan is funding. In 1995, the City obtained funding for transportation from a number of sources, but primarily from a portion of the state gas tax returning to the City. The City received \$3.8 million from gas taxes in the fiscal year 1995-96. Expenditures from this funding source were limited to road construction and maintenance. This relatively stable source of funding accounted for the bulk of funding for road maintenance and minor capital projects in Sunnyvale.

Traditionally, state and federal governments have made additional funds available from gas taxes, bonds, or other sources for major capital improvements on a limited, discretionary basis. Competition for these funds is great, and projects must meet many specialized requirements to be eligible. In this manner federal and state policy goals are imposed on the City. These goals can include improving air quality, land use, transportation coordination, and travel safety. City policy must be flexible enough to respond to the priorities of the funding sources. Major funding from these sources is critically needed and anticipated in order to implement the City's transportation plans.

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### *Environmental Mitigation*

The California Environmental Quality Act (CEQA) requires that public agencies assess the potential for environmental impacts from projects either undertaken by the agency or supported by agency approval or assistance. Environmental reviews inform agency decision makers of the potential for environmental impacts, as measured against thresholds of significance. A city's general plan or other city policies often establishes standards that can be considered as thresholds of significance. If an impact exceeds a threshold, the impact is considered significant, and mitigation measures must be identified and addressed.

A mitigation measure is an action taken to decrease or eliminate a negative environmental impact caused by a project. The agency can then consider incorporating that mitigation into the project. CEQA provisions exert a strong influence on both land use and transportation planning activities.

For example, the environmental review of a proposed land development may indicate that the project will create a significant traffic increase, impacting the level of service (LOS) at certain intersections. The City has recognized that free-flowing traffic is an important community value and has expressed this as a LOS standard in the General Plan. If the environmental review indicates a violation of the City's LOS policy, decision makers are informed. They can then decide whether to require the developer to assist with improvements to transportation facilities, use City resources to mitigate the deficiency, or accept the deficiency as a cost outweighed by the benefits of the project.

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## Inside Influences

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### *Municipal Code*

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The Sunnyvale Municipal Code influences City transportation policy in a number of ways. City ordinances provide technical standards for roadways as well as landscaping requirements. Rules and regulations regarding work in public rights of way are also set forth in the Municipal Code. Traffic laws unique to Sunnyvale are contained in the Code, including on-street parking restrictions, truck routes, bicycle and pedestrian restrictions, and transportation demand management requirements. The Municipal Code provides tools critical to linking transportation actions to land development. Title 19 (the Zoning Code) includes the City's off-street automobile parking requirements and establishes the ability for the City to require the provision of certain facilities, such as driveways, channelization islands, bicycle parking, and bus duck-outs, before approving a development proposal.

In 1993, the City adopted the Air Quality Sub-Element to the General Plan to reduce air pollutant emissions from existing sources in Sunnyvale, as well as to reduce air pollutants in the future. Several policies and action statements in the Air Quality Sub-Element are intended to influence transportation policies and planning, as are policies and action statements from the Energy Sub-Element and other elements and sub-elements of the City's General Plan. A discussion of the relationship between the General Plan, the Capital Budget, and the Resources Allocation Plan is located in Chapter 1.

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## CONCLUSIONS

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As discussed in the beginning of this chapter, Sunnyvale's regional setting greatly impacts the City. Growth is expected to continue in Santa Clara County and the Bay Area as a whole. Sunnyvale shares resources with other communities in the region and is both benefited and constrained by its central location in Silicon Valley.

This chapter presents current land use and transportation conditions in the City. These conditions are a result of the City's past and present plans and policies in conjunction with the regional and local economic climate.

Regional demand for housing, transportation capacity, and jobs in Sunnyvale and surrounding communities will continue to put pressure on City-wide and neighborhood planning efforts. Balancing the regional pressures with City and neighborhood priorities is a primary concern addressed in the Land Use and Transportation Element.

The next chapter builds on the background information presented in this chapter, and explores how two activities—land use and transportation planning—can be coordinated in ways that are mutually beneficial and to the future of the City.

This chapter concludes by identifying potential policy questions related to the linkages between land use and transportation. Some of these policy questions are:

- ◆ Since population growth is expected to continue, and since the future population mix will likely be more ethnically diverse with a different age structure than today's population, will current residential land use regulations and policies be adequate to provide the kinds of housing that the coming population will need? If not, what changes should be made?

- ◆ Since Sunnyvale's strong job base has been a driving force behind the ongoing demand for more housing and transportation capacity, should the City take measures such as:
  - ◆ Impose more rigorous controls of the industrial floor area ratio (FAR) to limit further expansion of the job base, in order to generate a lower future transportation demand?
  - ◆ Take further steps to encourage more intense use of available residential land, in order to provide more housing for a strong job base and growing population?
  - ◆ Develop a strategy that involves a combination of these two actions?
- ◆ To encourage greater transit ridership, should the City actively promote more mixed use developments? If so, where should they be located? Do current development standards adequately address the special characteristics of this approach to land use?
- ◆ Should the City re-examine its industrial zones and land use standards, in order to consider whether uses such as churches and day care facilities are appropriate for industrial areas?
- ◆ What should the City do to maintain and enhance the identity of individual neighborhoods and the community as a whole?
- ◆ Should the City take further measures to enhance and encourage redevelopment in the downtown area?
- ◆ Should the City actively promote the development of commercial services convenient to residential and industrial areas? If so, what should the City's role be?



- ◆ Given forecasts that several Lawrence Expressway intersections as well as other roadway intersections in the City will achieve unacceptable levels of service prior to the year 2010, should the City take measures such as the following:
  - ◆ Should the City include further improvements within the capital budget program?
  - ◆ Should the City assertively implement alternative transportation strategies, such as transportation demand management programs?
  - ◆ Should the City develop land use strategies that reduce the traffic impact of land uses?
  - ◆ Should the City accept a lower level of service at some intersections?
  - ◆ Should the City develop a program that includes some combination of these strategies?
- ◆ Should the City take further measures to enhance and encourage pedestrian travel? If so, what might these measures be?
- ◆ What should the City do to encourage more transit commuting?
- ◆ What should the City do to encourage more bicycle commuting?

Finding good answers to these questions will require ingenuity. However, Sunnyvale has earned a reputation for creative problem solving. The following chapter examines the issues raised by these questions. Recommendations that evolve from the analyses then form the basis for the goals, policies, and action statements (Chapter 5) that define Sunnyvale's strategic land use and transportation plan for the future.